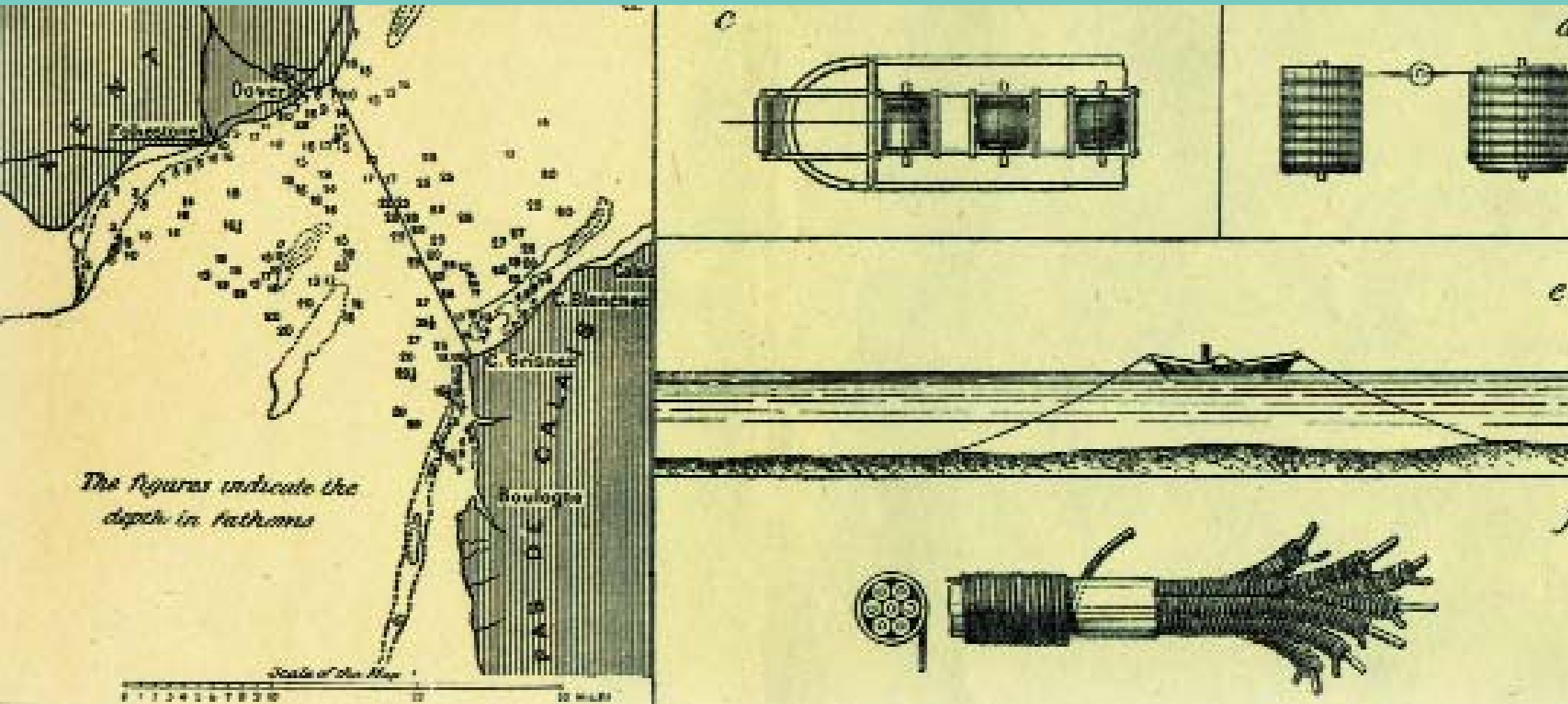


Submarine Telecoms FORUM



An international forum for the expression of ideas and opinions
pertaining to the submarine telecoms industry

Issue 14
May 2004

Failure was never an option . . .

Marine Recovery Operations aboard the cable ship TYCO DECISIVE

On the afternoon of Tuesday March 9, 2004, Tyco Telecommunications (US) Inc. received a request from the Baltimore City Fire Department for assistance in locating three victims of the tragic water taxi accident which occurred on the previous Saturday. Within 15 minutes of receiving the request, Tyco Telecommunications requested and received permission from the ACMA to use the vessel and began mobilization efforts. Departing at 0800 the following morning, the TYCO DECISIVE maneuvered to the location of the accident and began a series of dives with her unmanned submersible vehicle.

For more than 20 years, Baltimore has been the home port for Tyco's Atlantic cable ships. These ships are a landmark on the Baltimore waterfront along I-95 just south of the Fort McHenry tunnel. TYCO DECISIVE, Delivered in March 2003, is under charter from Tyco Telecommunications to the Atlantic Cable Maintenance Agreement, better know as the ACMA.

The unmanned, remotely operated submersible vehicle or ROV is operated by a highly specialized Tyco Telecom crew aboard the mother ship TYCO DECISIVE. Outfitted with highly accurate Differential Global Positioning System (DGPS) navigation aids, sonar, and camera equipment, the ship and

By Frank Cuccio

self propelled ROV are normally used for the inspection and burial of submarine telecommunications cables. With a depth rating of 2500 meters, the 20 meter depths of the Baltimore Harbor ship channel were no problem for the Nereus ROV. Typical cable operations in the open ocean utilize the four cameras aboard the ROV for visual inspection of the seabed. Baltimore's harbor bottom turned out to be a tangled mess of manmade and natural debris with absolutely zero

visibility. During the first 24 hours of recovery operations, the Nereus ROV was maneuvered along the harbor bottom and used her forward looking side scan sonar to identify objects of the approximate size and shape of the victims. Working in the extremely cold and dark water, Baltimore City Fire Department divers, in conjunction with TYCO DECISIVE and Nereus ROV, made a series of dangerous dives on targets identified by Nereus only to find debris. With hundreds of potential targets on the bottom of the harbor, it was clear that a miracle would be required to find the victims.

During the evening operational briefing, Tyco's head submersibles engineer, Phil Walker, described a device called a DIDSON Acoustic Sonar that was reported to provide a near video quality image in a zero visibility environment. After several phone calls, two such devices were located. Recognizing the extreme nature of this situation, Tyco Telecommunications issued a verbal order at 5 p.m. Thursday to the MagnaPatch Company in Houston, Texas. Howard Bailes, President of MagnaPatch quickly packed his gear, boarded a flight and hand carried the DIDSON, arriving aboard TYCO DECISIVE at 2 a.m. on Friday, only 9 hours later.

With the ROV recovered and routine preventative maintenance performed, the ROV



TYCO DECISIVE

engineers were standing by when Howard arrived and immediately began the complex task of integrating the DIDSON to the ROV system. With twelve hours of integration efforts logged, system tests revealed a communication problem between the submersible and the mother ship. While efforts to resolve this problem continued, Phil Walker called on Dave Clifford, President of Prizm Inc., manufacturer of the communication circuit boards. Dave responded to Phil's call early Friday afternoon by locating the spare boards and hand carrying them to the TYCO DECISIVE.

As additional insurance, Dave brought the circuit board design engineer, Geoff Huntington to assist with the installation and trouble shooting. These efforts paid off and after a total of 20 hours of integration efforts the ROV was ready to dive and resume the search. The DIDSON performed as advertised and provided the ROV crew with near video quality images of the seabed.

To expedite the search and focus the ROV to specific target areas, Tyco Telecommunications worked in cooperation with John DeMille from Marine Sonic Technology LTD, who provided target data from a separate side scan sonar towed from a Fire Rescue boat. The target data was electronically plotted on Tyco's shipboard charting system, and after careful evaluation, was used to prioritize the search areas. Working in two 12 hour shifts, the Tyco ROV crews methodically searched the seabed using the ROV's side scan sonar.

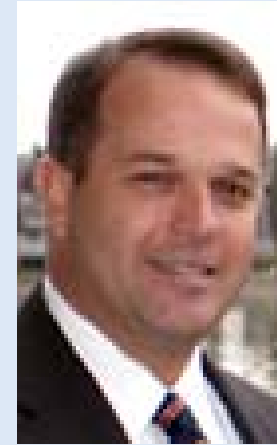
With a range of approximately 10 meters, the side scan sonar was able to identify possible targets on the harbor bottom. Once targets were identified

and classified by side scan sonar, the ROV was maneuvered closer to the target and the DIDSON unit was focused on the target. By using the broader beam side scan sonar and the narrow beam DIDSON, the Tyco ROV crews were able to rule out debris and positively pinpoint the location of the missing victims.

With the DIDSON focused on the victim, the ROV was positioned about a meter away on the seabed. The dynamically positioned cable ship TYCO DECISIVE was maneuvered directly adjacent to the ROV umbilical. Using TYCO DECISIVE as a command center, the Baltimore City Fire Department Special Operations Dive Team and Tyco Telecommunication's team worked together to brief divers, showing them a video of the ROV position and victim's position. TYCO DECISIVE created a lee for the dive support boat and the ROV umbilical served as a down line for the Baltimore City Fire Department divers. This technique reduced dive time to a minimum and greatly assisted the divers who worked in the extremely cold and dark waters.

The three victims were successfully located and recovered through the combined efforts of Tyco Telecommunication's personnel and the Baltimore City Fire Department. The parents of one victim released a statement thanking the Fire Department and Tyco Telecommunications. "We are very grateful for the recovery of Corinne and look forward to bringing her home. This brings our family a measure of closure to this tragedy and will allow us to focus on grieving for the sudden and heart breaking loss of Corinne and Andrew Roccella."

While the tragedy of the lives lost overwhelms the technical achievement of the recovery efforts, we



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ship fleet, submersibles, cable depots and the wet maintenance business. Frank is a former Merchant Marine Engineering Officer, and has a Bachelor Degree in Marine Engineering from S.U.N.Y. Maritime College, Master's Degree in Industrial Engineering from Purdue University and a Masters Certificate in Project Management from George Washington University.

are proud of our accomplishments. This group of Tyco Telecommunications employees worked 24 hours per day for five days, called in I.O.U.'s, personal favors, leveraged Tyco's vast resources, solved engineering problems, battled fatigue, and bitter cold weather to exemplify Tyco's commitment to excellence. Speaking on behalf of the forty nine Tyco Employees aboard TYCO DECISIVE, the recovery of these victims was personal. Failure was never an option.

